

when the President of the Society, Prof. Edgar Smith, presided over a meeting of delegates for the reception of addresses. The President began by a speech in which he set forth the share taken by Franklin in the foundation of the Philosophical Society, and the bearers of addresses then handed to him successively, in the chronological order of the several foundations, the documents with which they had been entrusted. I myself had the honour of presenting addresses from Cambridge, the Royal Society, the Royal Institution, the British Association, and the Royal Meteorological Society. I do not know the whole number of addresses, but 126 bodies were represented in one way or another. The evening ended with an interesting ceremony, when Mr. Carnegie, in his robes as Lord Rector of the University of St. Andrews, conferred the degree of doctor on Miss Irwin, a great-granddaughter of Franklin; she is principal of Radcliffe Hall, which bears nearly the same relation to Harvard University that Newnham and Girton do to Cambridge.

Wednesday, April 18, was devoted to the reading of scientific papers, as in a national meeting of the British Association. The session was continued on the afternoon of Friday, and twenty-three papers in all were read. Amongst the papers which appeared to excite the greatest interest were those by Chamberlin, de Vries, Pickering, Hall, and Lorentz. I myself gave an account of a paper recently presented to the Royal Society, but as yet unpublished; but before doing so I had the pleasure of presenting to the Philosophical Society two Wedgwood medallions of Benjamin Franklin and of Erasmus Darwin. The archives of the Society show (what I was not aware of) that both Erasmus Darwin and my father had been honorary fellows—an honour which I share myself.

On Thursday morning, April 19, the University of Pennsylvania (of which Franklin was the initiator) conferred, at the hands of its Provost, Mr. Harrison, a number of honorary degrees in the fine theatre called the Academy of Music. The whole pit was occupied by students, and a national flavour was conferred on the ceremonies by their staccato college yell, and by their singing college songs.

An altogether exceptional feature of the ceremony was that a degree was conferred on the King, who was represented by Sir Mortimer Durand, H.M. Ambassador at Washington. In announcing this degree the Provost read with great effect the celebrated speech on England from Henry V. It is pleasant to record the enthusiastic cheers which the whole audience gave, standing, as the Ambassador was hooded. Some fifteen or twenty degrees were afterwards conferred, and the recipients—amongst whom I may name de Vries, Lorentz, Marconi, and Rutherford—were greeted with hearty cheers by the students. Afterwards the Attorney-General of Pennsylvania, Mr. Carson, gave an address on the shares borne by Franklin and by subsequent benefactors in the foundation of the University. In the afternoon there was a public procession to the grave of Franklin, but as I was not present I am unable to give any account of the proceedings.

On Friday morning, April 19, we heard some interesting speeches in the theatre by Mr. Furness, President Elliot, and Mr. Choate, formerly ambassador in London, on the various sides of Franklin's character and activity. On the stage in full view of the audience was the portrait of Franklin which had been removed from America by General Grey at the time of the revolutionary war. It has just been presented to the President of the United States by Lord Grey, Governor-General of Canada, and its ultimate destination will, I believe, be the White House at Washington. This graceful act of international courtesy is highly appre-

ciated in America, and the fact that it coincides with the bicentenary of Franklin's birth can hardly be merely accidental.

After the addresses of which I have spoken came the presentation to the Republic of France, through the French Ambassador, M. Jusserand, of a gold medal commemorative of Franklin. All who have studied the history of the revolutionary war know the importance of Franklin's residence in Paris as a determining factor in the outcome of the war. It may easily be imagined how great was the enthusiasm created by this ceremony.

The festival closed with a banquet in the evening at which there were many striking speeches. An American dinner is managed somewhat differently from our own, for the toast-master is not, as with us, a servant with a stentorian voice, but is the most highly honoured of the hosts of the occasion. Dr. Weir Mitchell, the illustrious physician, performed this arduous task, and gave us a number of appropriate little speeches to the admiration of all.

To describe the other speeches would be simply tedious, but I may mention the excellent speech of M. Jusserand, who referred with the most exquisite tact to the appalling disaster of San Francisco, then at its full height. M. Jusserand is the most accomplished living student of England of the Plantagenet times, and his speech, although clothed in English, retained all the grace of its French origin.

It was natural that the ruin and misery at San Francisco should exercise a certain depressing influence on all, but those responsible for the proceedings determined, rightly, as I think, to carry them through as planned.

Those who have taken part in such festivals in America need not be told that the organisation was admirable and the hospitality unbounded.

G. H. DARWIN.

## NOTES.

THE seventy-eighth annual meeting of the German Association of Naturalists and Physicians will be held at Stuttgart on September 16-22.

A REUTER message from Rome on May 5 reports that the volcano of Stromboli is in active eruption. Advice received from Tacna, Chile, state that a violent earthquake shock was felt in that city on May 6, the vibrations lasting thirty-five seconds. The shock was also felt at Arica.

THE death is announced of Prof. Eugène Renevier, professor of geology and palæontology at the University of Lausanne. Prof. Renevier was president of the Swiss Geological Society and president of the Simplon Geological Society.

ON Saturday week, May 19, Sir James Dewar will deliver the first of a course of two lectures at the Royal Institution on "The Old and the New Chemistry." The Friday evening discourse on May 18 will be delivered by Prof. Arthur Schuster, on "International Science."

THE second annual dinner of the London section of the Society of Dyers and Colourists will be held on Wednesday, May 23. Persons interested in dyeing and the allied industries who are not members of the society are specially invited. Particulars may be obtained from the hon. secretary, Mr. Wallace Burton, 219 Shooters Hill Road, Blackheath, S.E.

AT the final meeting of the sixth International Congress of Applied Chemistry on Saturday, it was resolved that the seventh congress shall be held in London, with Sir

William Ramsay, K.C.B., as the president, and Sir Henry Roscoe as honorary president. We hope to give in an early issue an account of matters of interest and importance brought before the recent congress at Rome.

THE astronomical observatory of La Plata has been affiliated with the new National University of La Plata, recently inaugurated by the Minister of Public Instruction of the Argentine Republic. The director of the observatory, Mr. Francisco Porro, invites observers in similar institutions to exchange publications with him, at the Observatorio Astronómico, Universidad Nacional, La Plata.

WE learn from *Science* of April 27 that the University of California and the Lick Observatory were not damaged by the disastrous earthquake of April 18. The buildings of Leland Stanford Junior University suffered severely, the loss being estimated at 800,000. The building of the California Academy of Sciences and its valuable collections were destroyed.

THE engineering journals publish lengthy obituary memoirs of one of the most prominent figures in the industrial life of the north of England—Sir David Dale, Bart., of Darlington, who died suddenly on April 28. He was an eminent authority on economic questions, and probably did more than anyone to promote industrial peace. He was one of the founders of the Iron and Steel Institute, and served as treasurer until his election as president in 1898.

THE Harben lectures of the Royal Institute of Public Health will be delivered by Prof. Elie Metchnikoff, of the Pasteur Institute, Paris, on May 25, 28, and 30. A course of three lectures on "The Bacteriology of Water, Milk, and Tuberculosis," by Dr. Carl Prausnitz, commenced at the institute on Wednesday, May 9, and a course of three lectures on "The Manufacture and Sophistication of Potable Spirits," by Dr. C. E. Harris, will begin on June 12.

WE regret to see the announcement that Mrs. Brightwen, the popular writer on natural history, died on May 5 at seventy-five years of age. In 1890, at the age of sixty, Mrs. Brightwen published her first book, "Wild Nature won by Kindness." This book was very successful. In 1895 "Inmates of My House and Garden" appeared; then followed, in 1897, "Glimpses of Plant Life"; in 1899, "Rambles with Nature Students"; and in 1904, "Quiet Hours with Nature." Mrs. Brightwen was vice-president of the Selborne Society, a Fellow of the Zoological and Entomological Societies, and an active member of various local associations connected with the encouragement of natural history.

THE eighty-ninth annual meeting of the Société helvétique des Sciences naturelles will be held at St. Gall on July 21 to August 1. This will be the fifth time since the foundation of the society that the town of St. Gall has been the place of meeting. On Tuesday, July 31, there will be a discussion on variations among plants and animals and their phylogenetic and physiological importance, with reports upon the subject by Profs. Goebel and Ernst. During the meeting there will also be papers on the following subjects:—modern views on the tectonic synthesis and genesis of the Alps, Prof. Schardt; measurements of base lines in general, with particular reference to the geodetic work connected with the Simplon Tunnel, Prof. Rosenmund; results of the latest explorations made in the Wildkirchli grotto, and their importance to zoology and prehistoric science, Mr. E. Bächler; fossil remains at Kesslerloch and from palæolithic grottos in general, Prof. C.

Hescheler; studies of the plankton of the Lake of Constance. The president of the society is Dr. G. Ambühl, and the two secretaries are Dr. H. Rehsteiner and Dr. A. Dreyer.

AFTER being closed for a very considerable time, the fish gallery of the British Museum (Natural History)—or, to be accurate, the southern half of it—has just been re-opened to the public in what may be termed a metamorphosed condition. In place of a dismal crowd of ill-mounted specimens, faded, for the most part, to one dull uniformity, the public has now a small but well-assorted selection of specimens, coloured artificially to imitate, so far as practicable, their appearance in life, and arranged in such a manner that they can be seen to the very best advantage. Descriptive labels—of which only a portion are yet printed—will render the exhibit about as perfect as is at present possible, and the gallery as a whole will enable the public to gain the greatest possible amount of information about fishes with the least possible trouble. As regards the advisability of colouring exhibited specimens of this nature there can scarcely be two opinions, for, although with our present methods and our present lack of knowledge of the appearance of many fishes in life it is impossible to imitate nature closely, yet such an approximation to natural colouring as it is practicable to make is infinitely better than no colour at all.

THE annual dinner of the Institution of Mining and Metallurgy was held on May 4, when a distinguished company of engineers and others assembled. Sir Julius Wernher, in proposing the toast of the institution, insisted that the mining industry has been conducted in the past as seriously and honourably as any other industry in the world. In replying to the toast, the chairman, Mr. William Frecheville, read a letter from Mr. Birrell, the President of the Board of Education, stating that the Government is keenly interested in the proposal to establish an institution at South Kensington for the advancement of the highest technical education, and that a scheme is in course of preparation designed to give effect to the recommendations of the recent departmental committee. The letter went on to express satisfaction that various bodies and persons associated with mining and metallurgy are showing sympathy with the proposed college by contributing to the Bessemer fund, which has for its object the furtherance of mining and metallurgical science by means of advanced education. Mr. Birrell's letter concluded by expressing the hope that this excellent example may be followed by other great industries, all of which must depend for success in no small degree upon the promotion of the study of the higher branches of science. The chairman announced that the subscriptions to the Bessemer memorial amounted to 11,000.

DR. W. N. SHAW, F.R.S., delivered the second of his instructive lectures on "Atmospheric Circulation and its relation to Weather" at the University of London on May 8. The subjects specially dealt with related to persistent and periodical winds, tropical revolving storms and cyclonic depressions of middle latitudes. The lecturer referred more particularly to the rainfall in the various wind-systems, especially in the monsoons, and also quoted some remarkable instances of increase of rain with height above sea-level, for example, at Ascension and St. Helena. Among the many interesting diagrams thrown on the screen we may mention one showing a remarkable fall of the barometer from 755 mm. to 728 mm. during a typhoon at Manila in October, 1882, with an equally sudden rise

in the course of a few hours. A wind velocity of 120 miles in the hour (old factor 3) was recorded in this storm. Diagrams of depressions moving across the British Isles were also shown, and an ingenious explanation was given of the usually heavy rainfall in the central portion of the storms.

THE contents of the April number of the *American Naturalist*, which include three articles, are chiefly interesting to specialists. The first, by Mr. A. S. Pearse, is devoted to the fresh-water copepod crustaceans of Massachusetts, of which several new species are described. In the second Dr. J. B. Pollock discusses variations in the pollen-grain of *Picea excelsa*, while in the third Mr. A. M. Reese describes in considerable detail the anatomy of the American salamander, *Cryptobranchus allegheniensis*, comparing and contrasting it with that of its larger relative of Japan and China.

THE *Journal of Anatomy and Physiology* for April is mainly devoted to anatomical subjects. Dr. Bertram Windle contributes a valuable report (the sixteenth) on recent teratological literature.

THE new catalogue (thirty-third edition) of microscopes and appliances issued by Messrs. Carl Zeiss, of Jena, gives a complete list of apparatus manufactured by this eminent firm. Some new and improved microscope stands are included, and the majority of achromatic objectives are reduced in price.

IN the *Révue Scientifique* (March 31) Dr. Remlinger discusses the rôle of the rat and mouse in the propagation of rabies. These animals are very susceptible to rabies, and Dr. Remlinger adduces evidence which suggests that certain cases of hydrophobia in man, apparently spontaneous, may be due to this source of infection.

ACCORDING to the *Pioneer Mail* (Allahabad, March 23), the Plague Research Commission has established beyond question the validity of the theory of plague transmission by rat-fleas. A room was selected in which had been found the dead body of a rat suffering from plague. Animals were placed in this room, some protected by fine metallic wire screens against the attacks of rat-fleas, others unprotected. It was soon found that the unprotected animals were attacked by plague, while the protected animals enjoyed a complete immunity.

WE learn from the *Pioneer Mail* that snakes and other wild animals accounted for the death of 2195 persons in the Madras Presidency last year, or twenty-six more than in 1904; and they caused the death of 14,899 cattle in 1905 as compared with 14,146 in the previous year. Of the fatalities among human beings, no fewer than 1896, or more than 80 per cent., were caused by snakes; while of those caused by other wild animals 155 were due to tigers, eighty to panthers, ten to wild pigs, nine to bears, eight to wolves, and five to wild dogs. The elephant only accounted for four deaths and the bison for only one, while the hyæna caused the death of two—presumably children. The total number of wild beasts destroyed, for which rewards were paid during the year, was 809, or four more than in the previous year. Included in this total are ninety-two tigers, 666 leopards and panthers, and fifty bears. The only method of reducing danger to life by snakes is apparently, according to our contemporary, the removal of prickly pear and noxious undergrowth.

BRYOLOGISTS who have had experience of Jameson's "Guide to Mosses" will be glad to know of a similar work, wherein Mr. Symes M. Macvicar provides a revised

key to the liverworts of the British Isles. It differs considerably from the key that was originally published in the *Journal of Botany* five years ago, although drawn up on the same lines. It contains merely the tables for determining the genera and keys to the species, without any further details. It is not apparent why the specific names are not given for the monotypic genera, as was done in the earlier issue.

IN a contribution to the *Annales Mycologici*, vol. iii., No. 6, 1905, Mr. E. S. Salmon describes three well-marked varieties of the fungus *Phyllactinia corylea*, two of them distinguished by the characters of the conidiophore and the third by the special shape of the conidia. To a certain extent the characteristic features of the varieties appear to be associated with certain hosts, and Mr. Salmon hopes to discover further new varieties in the examination of the conidial stages of the fungus on other host plants; for this purpose he requests the cooperation of mycologists to supply him with material. Should such new varieties be found, it is probable that *Phyllactinia*, like other genera of the Erysiphaceæ, will prove to have developed special biologic forms on different hosts.

AT the meeting of the scientific society of the Kaiserliche Akademie der Wissenschaften, in Vienna (February 1), Prof. F. Krasser and Mr. Kubart contributed a paper on the fossil flora of Moletain, in Moravia; the list of fossils includes *Gleichenia Kurriana*, *Sequoia Reichenbachii*, *Aralia formosa*, and *Eucalyptus Geinitzi*. Prof. O. Richter has confirmed the observation recorded by Molisch and others that seedlings, notably vetches and peas, respond more readily to the stimuli of light and gravity in the impure air of the laboratory than in the purer air of a greenhouse. An account of the nature of the mucilage in the fruit of the mistletoe and *Loranthus Europæus* was presented by Prof. J. Wiesner at the subsequent meeting on February 8.

THE occurrence in the United States of three fungi belonging to the Hypocreales or Perisporiales forms the subject of two papers by Prof. G. F. Atkinson. In the *Botanical Gazette*, December, 1905, he discusses the species *velutacea*, formerly referred to the genus *Hypocrea*, but now assigned to *Podocrea* or *Podostroma*. Tulasne and Winter stated that it was parasitic on *Clavaria*, but Prof. Atkinson agrees with Schröter that it is an autonomous plant, and adduces the evidence that he has obtained specimens in pure cultures from ascospores. In the *Journal of Mycology*, November, 1905, Prof. Atkinson describes a species of *Balansia*, a genus differing from *Claviceps* in the formation of a stroma without a sclerotium, found growing parasitically on *Danthonia spicata*, and another fungus, parasitic on *Andropogon*, for which he proposes a new genus, *Dothichlœ*, allied to *Hypocrea* and *Hypocrella*.

WITHIN the last five years much has been written on the subject of the disposal of towns' refuse by fire. The more technical points have, however, received slight attention, and in this direction a paper contributed to the Transactions of the Institution of Engineers and Ship-builders in Scotland (vol. xlix., part vi.) by Mr. H. Norman Leask throws much light. The forms of furnace in use and their accessories are described, and the results obtained in various parts of the world are considered. The results of careful tests show that, with a destructor of modern type, a high efficiency, both as regards evaporation and burning, is not more costly to work than a destructor burning at a lower rate and giving lower evaporative efficiencies.



THE general report of the Geological Survey of India for the year 1905, published by Mr. T. H. Holland, F.R.S., in the Records of the Geological Survey of India (vol. xxxiii., part ii.), is a document of permanent value. An enormous amount of valuable information on palæontology, petrology, physical geology, seismology, and economic geology has been got together, and the programme of work arranged for the current season indicates that results of more than ordinary interest are likely to be obtained. The investigation of the manganese ore deposits has now been completed, the deposits of chief importance consisting of braunite, psilomelane, and pyrolusite associated with and derived from manganese-bearing silicates occurring as bands and lentils in the Archæan schists and gneisses. In the same issue of the Records, Mr. T. D. La Touche and Mr. R. R. Simpson describe the Lashio coalfield in the northern Shan States, and Mr. R. R. Simpson describes the Namma, Man-sang, and Man-se-le coalfields, also in the northern Shan States. In the case of Lashio the results are not encouraging. The coal is lignitic with a large proportion of moisture and more than 9 per cent. of ash. The Namma coal, or rather lignite, is distinctly superior to that of any other field in the northern Shan States; but in its raw state it would be a distinctly poor fuel, unfit for locomotive use, and would be mined under the usual difficulties due to soft including rocks.

THE Meteorological Service of the Netherlands, the central office of which is at De Bilt, a suburb of Utrecht, was recently re-organised, and has commenced the issue of a neat octavo publication entitled *Mededeelingen en Verhandelingen*, containing memoirs on meteorological and allied subjects. The articles will be written in Dutch and French, or in French, English, or German according to the nature of the contributions or the wish of the authors. There are separate branches at Amsterdam and Rotterdam; these act as agencies for maritime purposes, and issue local weather forecasts, while the branch at Amsterdam deals exclusively with storm warnings. Among the various useful publications of the Netherlands Institute we may specially mention (1) the daily weather report; (2) the monthly weather review, containing the results of twelve representative stations; and (3) the annals, which have been issued in various forms for fifty-five years; they now contain (1) the results of the observations made in Holland, and at Paramaribo (Surinam), and (2) observations of terrestrial magnetism. The institute has from time to time published valuable works on marine meteorology, and is at present engaged on a meteorological atlas of the Indian seas and other useful investigations.

IN vol. i., part iv., of "Beiträge zur Physik der freien Atmosphäre," Prof. H. Hergesell gives an interesting account of the exploration of the upper air over the Atlantic Ocean north of the Tropic of Cancer, from the Prince of Monaco's yacht in the year 1905. The observations were made under Prof. Hergesell's superintendence by means of tandem sounding-balloons, between 26° and 38° N. lat., and 10° and 42° W. long., and therefore partly in the true region of the trade winds; the chief object was to determine whether the results obtained in the previous year by means of kite experiments between Gibraltar and the Canaries, along the African coast, would be found in the open ocean, beyond the influence of the continent and islands, and at much greater altitudes. The observations of temperature and humidity completely confirmed those obtained in 1904, and further showed that up to altitudes of 12,000 metres and more, winds with northerly components prevailed, and that the anti-trade wind supposed

to exist in the adopted theory of atmospheric circulation, was not found in those latitudes over the free ocean. Southerly winds were only observed on one day at altitudes of 2000 metres and upwards in lat. 25° 58' N., the most southerly point reached, but the next day, in lat. 26° 41' N., the northerly current had again set in. These results differ somewhat from those given by Clayton and Maurice, acting for Mr. Rotch and M. Teisserenc de Bort respectively, in the same latitudes, as they found southerly winds in the upper strata of air. It will be interesting to determine by further experiments whether this difference really exists, and whether in the observations near the Canaries especially it was possibly due to the proximity of the African coast.

A NEW apparatus for determining the mechanical equivalent of heat or thermal capacity of water is described by Prof. H. Rubens in the *Verhandlungen der deutschen physikalischen Gesellschaft*, viii., 5 (1906). In it the work is supplied by turning a cylinder 60 cm. long through 180° and allowing a weight to descend in oil, and the arrangements for the calorimetric determinations obviate the disadvantages of Grimsehl's apparatus.

REFORM of higher education in France forms the subject of a paper in the *Revue générale des Sciences* (xvii., 4) by Prof. A. Turpain. It would appear that the French statutes relating to the appointment of university professors are unsuited to the present times and operate to the detriment of the provincial universities, and, moreover, the new programme of the École Normale tends to draw students from the provinces to Paris.

A NOTE in the *Revue générale des Sciences* (xvii., 4) directs attention to a method of exploding mines by means of acoustic waves. The method is based on the property that when a disc, free to turn about its diameter, is placed in the interior of a cylindrical resonator and the fundamental note sounded, the disc will place itself in a plane perpendicular to the cylinder. By causing the turning disc to complete an electric circuit a mine can be exploded by means of a signal given by a siren on a warship, tuned to the same note as the resonator. The description is taken from the *Technische Rundschau*.

IN a note contributed to the *Atti dei Lincei*, xv., 6, Dr. G. A. Blanc communicates some further results regarding the radio-active substance discovered by him in the thermal springs of Echaillon and Salins Moutiers, in Savoy, and of which an account was given at the congress of radiology at Liège last year. The experiments show the presence of hydrates in which the radio-activity at first increases instead of continually decreasing, thus reproducing the phenomena associated with thorium hydrate rather than those attributed to the element thorium X; but the radio-activity of the present element is far greater than that of ordinary thorium hydrate. In the same journal Messrs. R. Nasini and M. G. Levi give a preliminary note on the radio-activity of the spring at Fiuggi, near Anticoli.

THE  $\alpha$  rays emitted by Prof. Marckwald's radio-tellurium are shown by Mr. H. Greinacher in No. 7 of the *Physikalische Zeitschrift* to be capable of causing a marked fluorescence in glass, and a similar but smaller effect in mica and quartz. The observation is of interest inasmuch as the  $\alpha$  rays of radio-tellurium have also been shown to possess the property of causing air to fluoresce.

PROF. NERNST and Mr. H. von Wartenberg describe in the *Verhandlungen* of the German Physical Society a new determination of the melting points of platinum and palladium. The method used was an optical one employing a Wanner pyrometer which was specially calibrated

for the purpose; the melting point of gold ( $1064^{\circ}$  C.) was taken as the standard of reference. Pure palladium was found to melt at  $1541^{\circ}$  C. and pure platinum at  $1745^{\circ}$  C. Dr. Harker's recent determination of the melting point of platinum gave a value of  $1710^{\circ}$  C.

IN spite of its importance as a fundamental physical constant, the latent heat of fusion of ice is known only very approximately. The value obtained by Bunsen was 80.03 cal., whilst Regnault found it to be 79.25 cal. In the *Journal de Physique* (vol. v., p. 157) M. A. Leduc points out that Bunsen's result is subject to an error due to an incorrect determination of the density of ice at  $0^{\circ}$ . A re-determination of this constant gave a value of 0.9176, and a re-calculation of the latent heat of fusion from Bunsen's data, using this value, gave a result of 79.2 cal. This is in close agreement with Regnault's determination. The principal difficulty experienced in determining the density of ice is in eliminating gas bubbles completely. M. A. Leduc describes an arrangement by which he was enabled to minimise this source of error.

SOME remarkable specimens of phosphorescent calcite from Joplin, Missouri, are described by Mr. W. P. Headden in the April number of the *American Journal of Science*. Some of the crystals, after being exposed to sunlight, were found to become highly phosphorescent, and to retain this property for a period of thirteen hours. The specimens of calcite which showed prolonged phosphorescence were always yellow in colour, and contained 0.007 per cent. of ceria, 0.012 per cent. of the didymium earths, and 0.013 per cent. of yttrium and erbium; the spectrum of the latter was very distinct. Purple-coloured specimens of calcite found in the same neighbourhood were shown to owe their colour to the presence of didymium, and to differ from the yellow calcite in being non-phosphorescent. So far as the analytical evidence goes, the phosphorescence of the yellow calcite seems to be associated with the presence of earths of the yttrium group.

A NUMBER of foliaceous and fruticose lichens collected by Mr. A. W. C. Herre on the Santa Cruz peninsula, in proximity to San Francisco, are described by him in vol. vii. of the *Proceedings of the Washington Academy of Sciences*. *Parmelia* is an important genus, as the species are both numerous and conspicuous; *Parmelia enteromorpha* is a characteristic lichen of the red-wood forest, and *Parmelia Herrei* provides a new species. The new species *Gyrophora diabolica* forms in its locality, the Devil's Cañon, the dominant feature of the lichen rock-flora; another interesting species is the lace lichen, *Ramalina reticulata*, that festoons the oaks. The writer has drawn up a useful key for the determination of genera, and keys to the species.

A PUBLICATION just received from the Harvard College Observatory describes in detail, and with examples, a telegraphic cipher code devised by Mr. W. P. Gerrish, of that observatory. Numerous advantages are claimed for this system over other systems now in use, its chief characteristic being the ready transmission of groups of figures in a form at once simple to dispatch and readily translatable. A test of the system between the Harvard and Lick observatories gave great satisfaction.

MESSRS. ARCHIBALD CONSTABLE AND CO., LTD., will publish shortly a new book by Prof. H. C. Jones, of the Johns Hopkins University, entitled "The Electrical Theory of Matter and Radio-activity."

MESSRS. DAWBARN AND WARD, LTD., are preparing a new issue of their "Directory of Photographic Dark

Rooms," and will be glad to receive from photographers information as to any public dark room not included in their directory.

SOME of the natural attractions of Norway are described in an illustrated booklet just received from the Albion Steamship Co., Ltd., Newcastle-on-Tyne, containing the itinerary of fortnightly pleasure cruises to the Norwegian fiords by the steam yacht *Midnight Sun*. The cruises are arranged so that passengers may see the most interesting scenery on or near the fiords from the Ryfylke to the Romsdal, and ample time is allowed for excursions away from the ship.

MR. C. L. MULLER has published a pamphlet giving an illustrated description of Dr. Looser's double thermoscope and some of the experiments possible with it. The instrument is an ingenious form of differential thermometer in which great sensitiveness is secured, and so arranged that it is possible to use it in making quantitative determinations. The booklet contains instructions for the performance of fifty-seven experiments in which the thermoscope can be employed.

### OUR ASTRONOMICAL COLUMN.

THE EXPECTED RETURN OF HOLMES'S COMET.—From the observations of Holmes's comet in 1899–1900, Dr. H. J. Zwiers has computed a set of elements of the comet's path and an ephemeris for the probable reappearance of the object during the present year.

Having computed the elements for the epoch 1899, Dr. Zwiers applied the Jupiter perturbations for the period January, 1899, to April, 1906, and for January 16.0 (G.M.T.), 1906, found the following elements:—

$$\begin{array}{l|l} M = 351^{\circ} 46' 52'' \cdot 14 & \phi = 24^{\circ} 20' 25'' \cdot 55 \\ \pi = 346^{\circ} 2' 31'' \cdot 63 & \mu = 517'' \cdot 447665 \\ \delta = 331^{\circ} 45' 40'' \cdot 75 & \log a = 0 \cdot 5574268 \\ i = 20^{\circ} 48' 53'' \cdot 30 & \end{array} \quad 1906 \cdot 0$$

The ephemeris computed from these elements extends from May 1 to December 31, 1906, and is given, for every alternate day, in No. 4085 of the *Astronomische Nachrichten*.

According to the above elements, the perihelion passage should have taken place at March 14.1804 (G.M.T.), 1906, but, in a supplementary table, Dr. Zwiers gives the ephemeris corrections which will become necessary should it occur either four days earlier or later.

THE LUMINOSITY OF THE BRIGHTER STARS.—An interesting discussion of the luminosity of the brighter stars is published by Mr. George C. Comstock in No. 3, vol. xxiii., of the *Astrophysical Journal*.

Of twenty-five stars discussed, the brightest in the heavens, Mr. Comstock finds that twenty-two have luminosities less than 1000, whilst three,  $\beta$  Crucis, Rigel, and Canopus, have luminosities greatly exceeding this value, the luminosity of the sun being taken as unity.

In Mr. Comstock's opinion, this irregular distribution of values and the enormous excess of the three exceptions above the mean value render it unlikely that the parallaxes hitherto accepted for these three stars are entirely trustworthy, for it is on them that the values obtained for the luminosities are based.

Surveying the whole discussion, Mr. Comstock arrives at the conclusion that there is no adequate evidence that the maximum of stellar luminosity exceeds 1000, and, further, he opines that the mean luminosity of first-magnitude stars is not less than 100.

THE VARIABLE RADIAL VELOCITY OF  $\epsilon$  AURIGÆ.—In No. 4084 of the *Astronomische Nachrichten* Dr. H. Ludendorff discusses the variable radial velocity of the star  $\epsilon$  Aurigæ.

The variability of this object was discovered by Fritsch in 1821, and its variable velocity by Vogel and Eberhard in 1902.

The present discussion is based on the measurements of